

The Hidden Secrets of the Geometry World

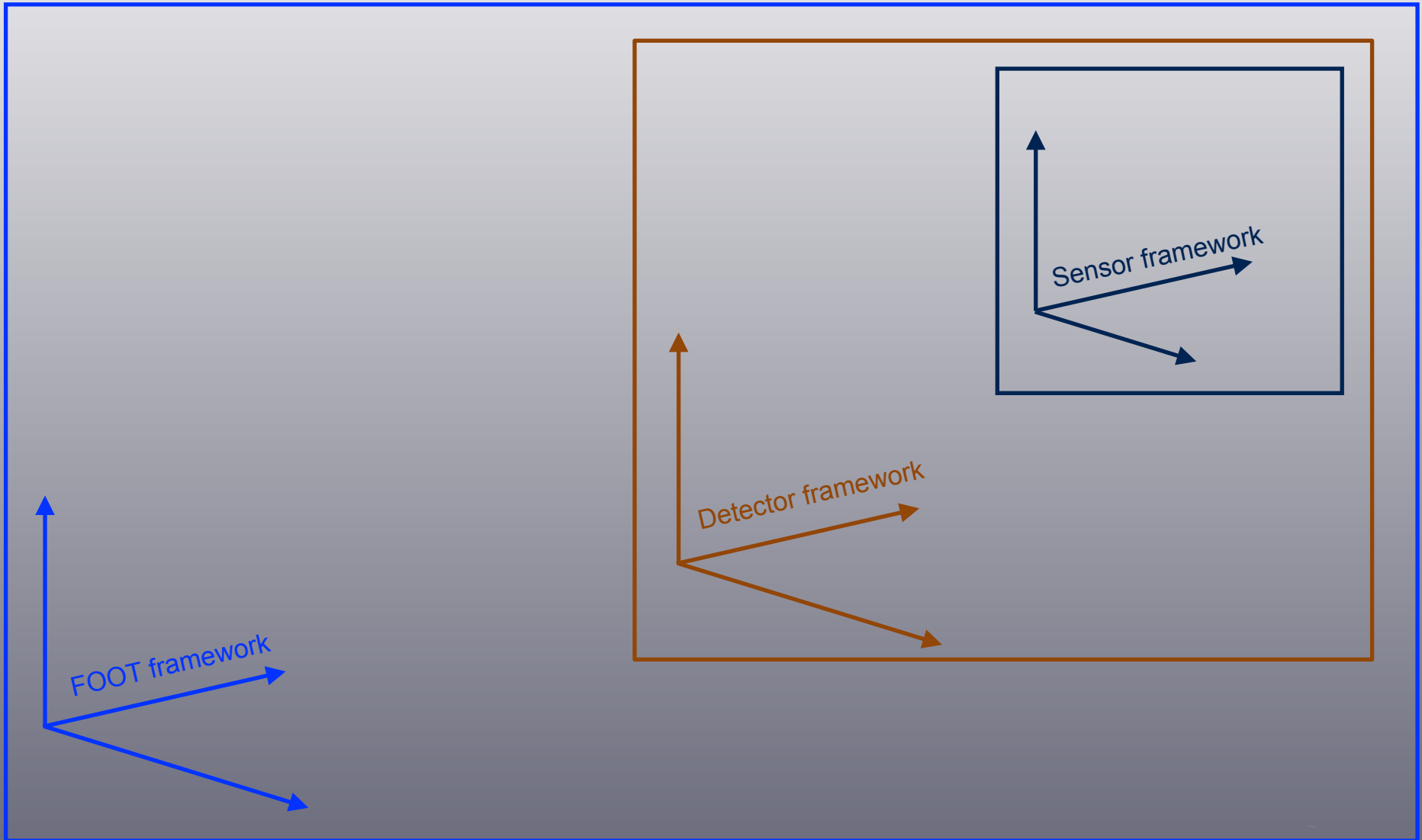
Introduction

Detectors

FOOT

Introduction

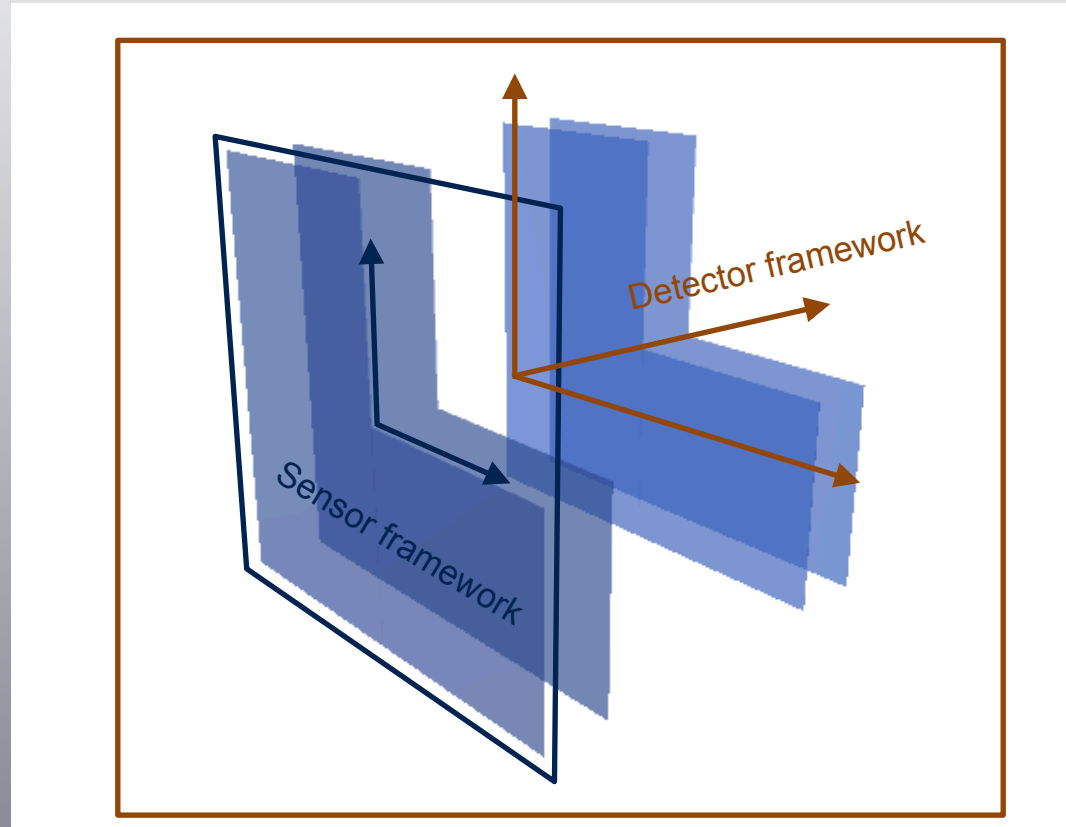
Frameworks



Detectors

Detector Geometry (i)

• Sensor - detector framework:



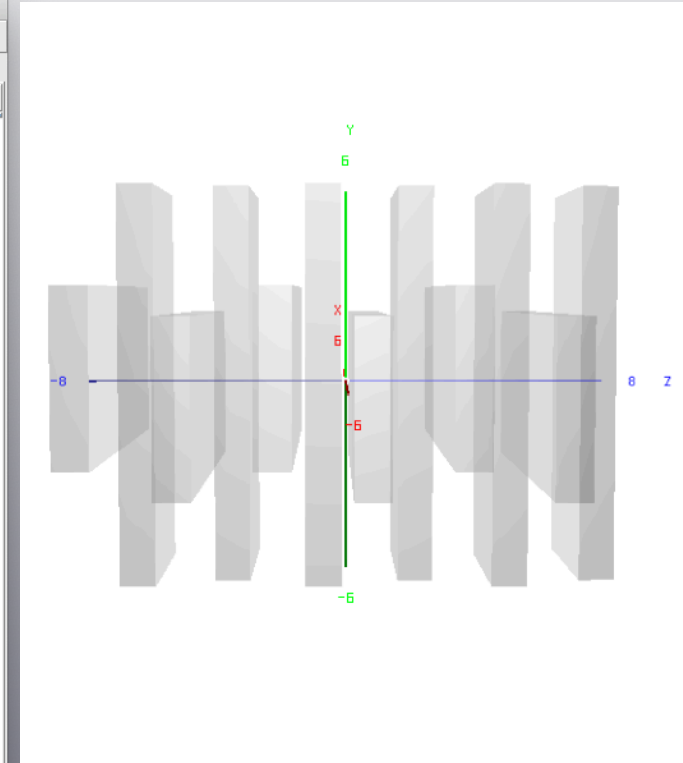
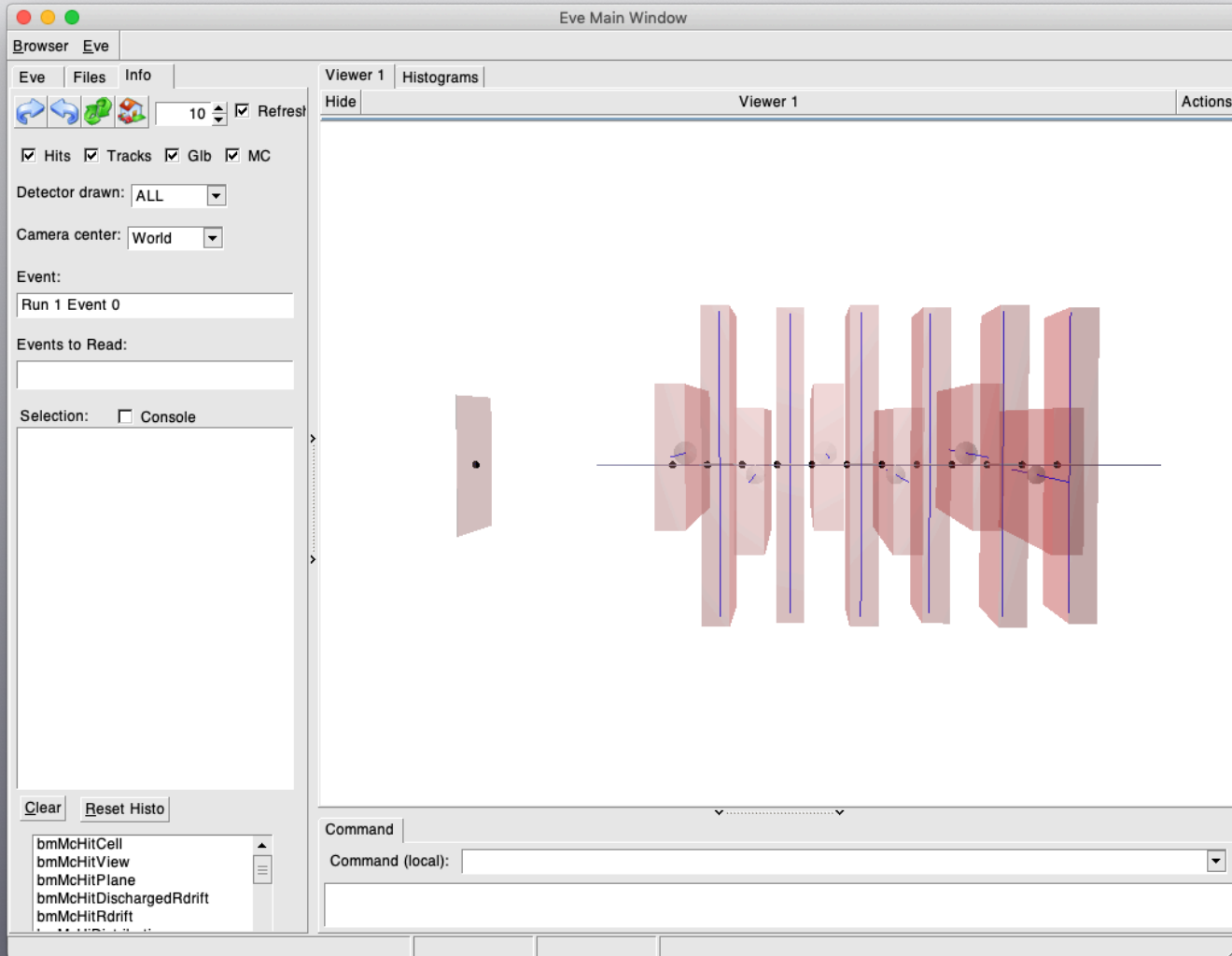
• Transformations:

- `TVector3 TA*parGeo::Sensor2Detector(..., TVector3 vec)`, from sensor to detector
- `TVector3 TA*parGeo::Detector2Sensor(..., TVector3 vec)`, from detector to sensor

➔ Detector's geometry built in the detector framework

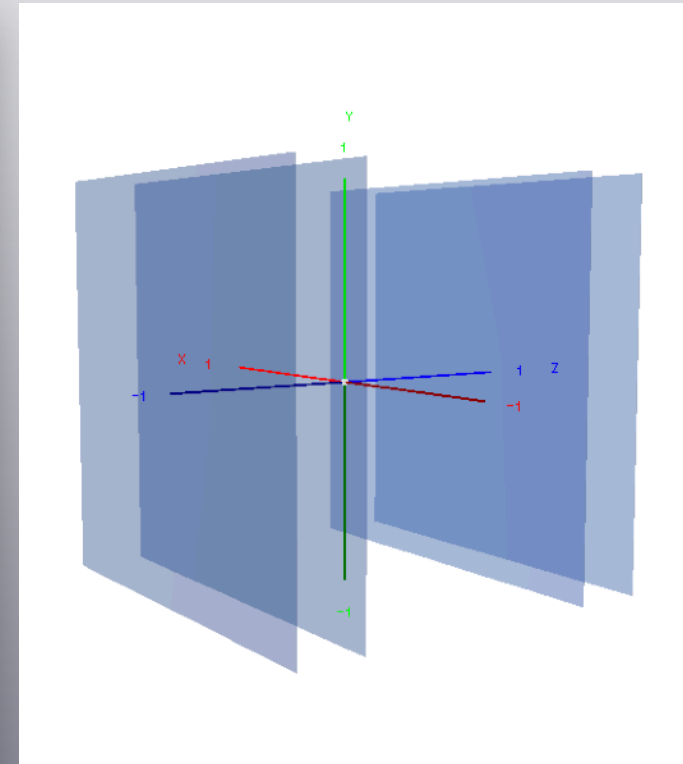
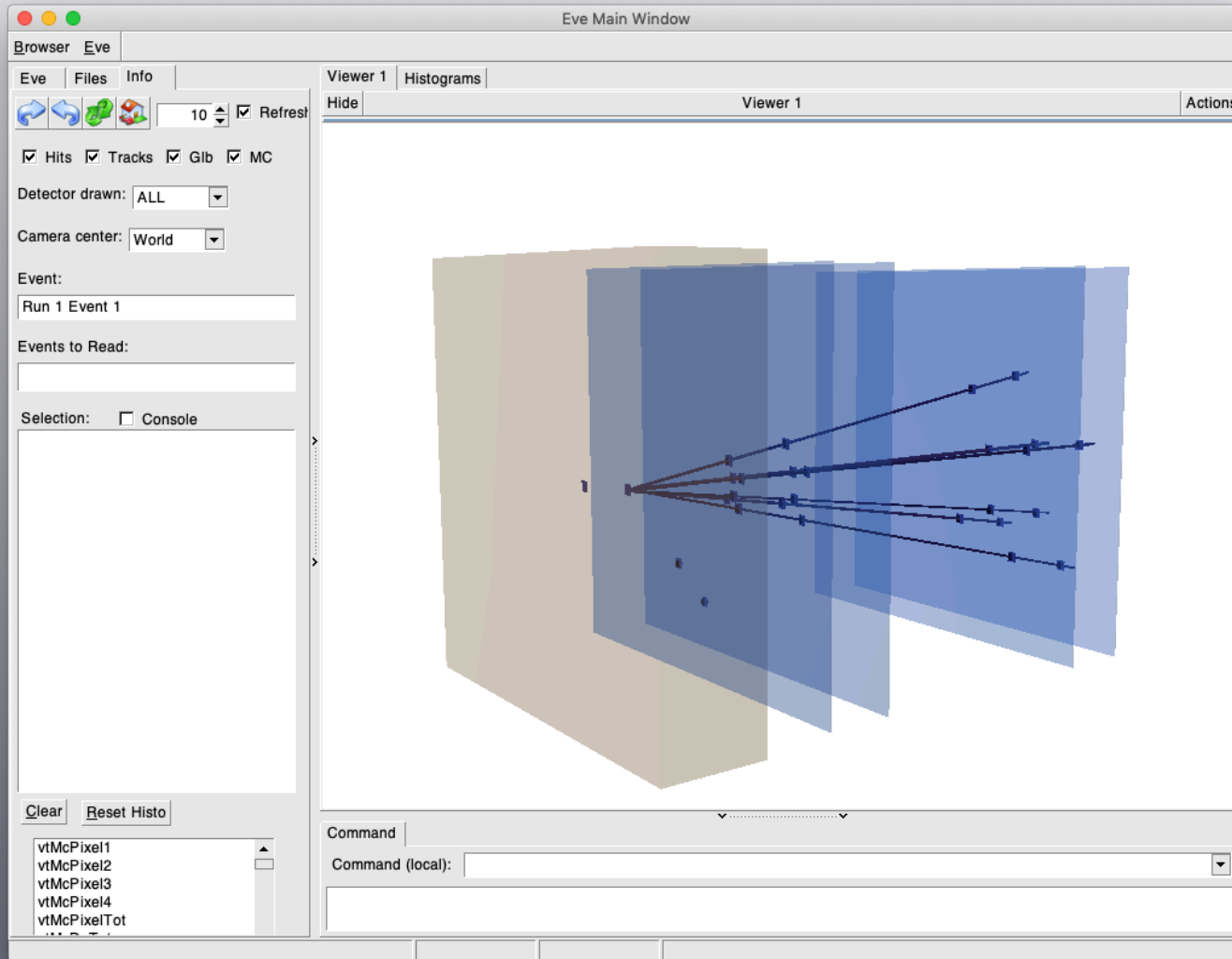
Detector Geometry (iv)

- Start counter and beam monitor event display



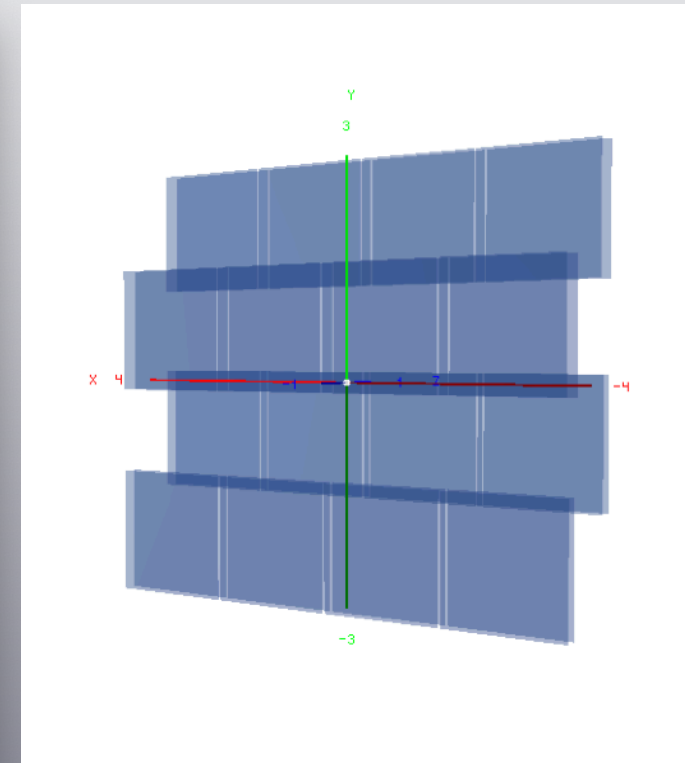
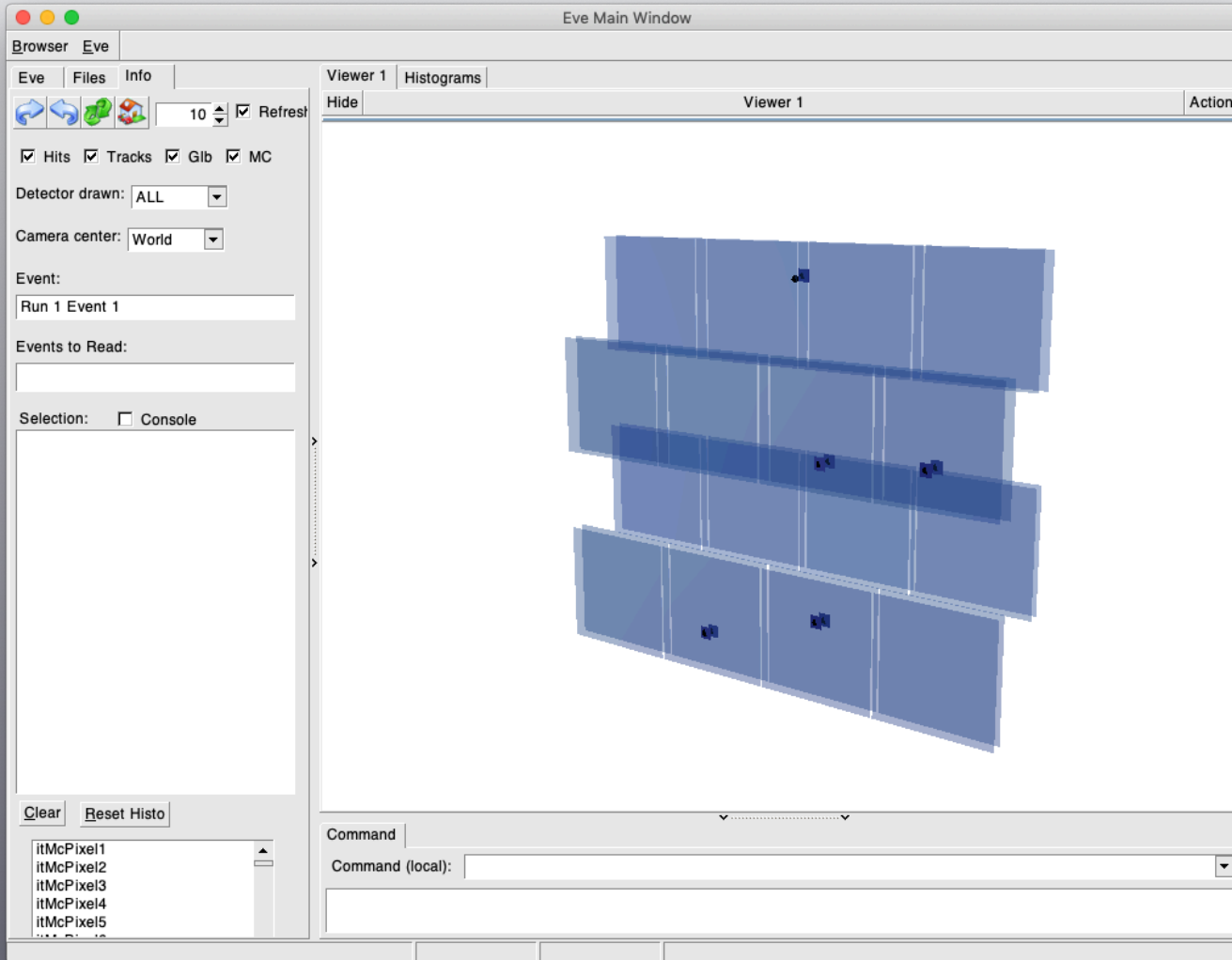
Detector Geometry (vii)

Target and Vertex display



Detector Geometry (ix)

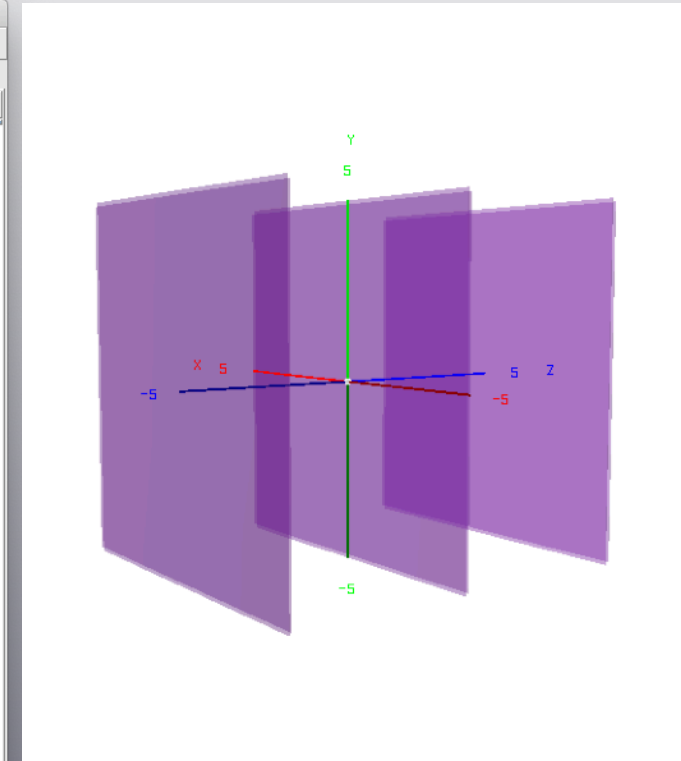
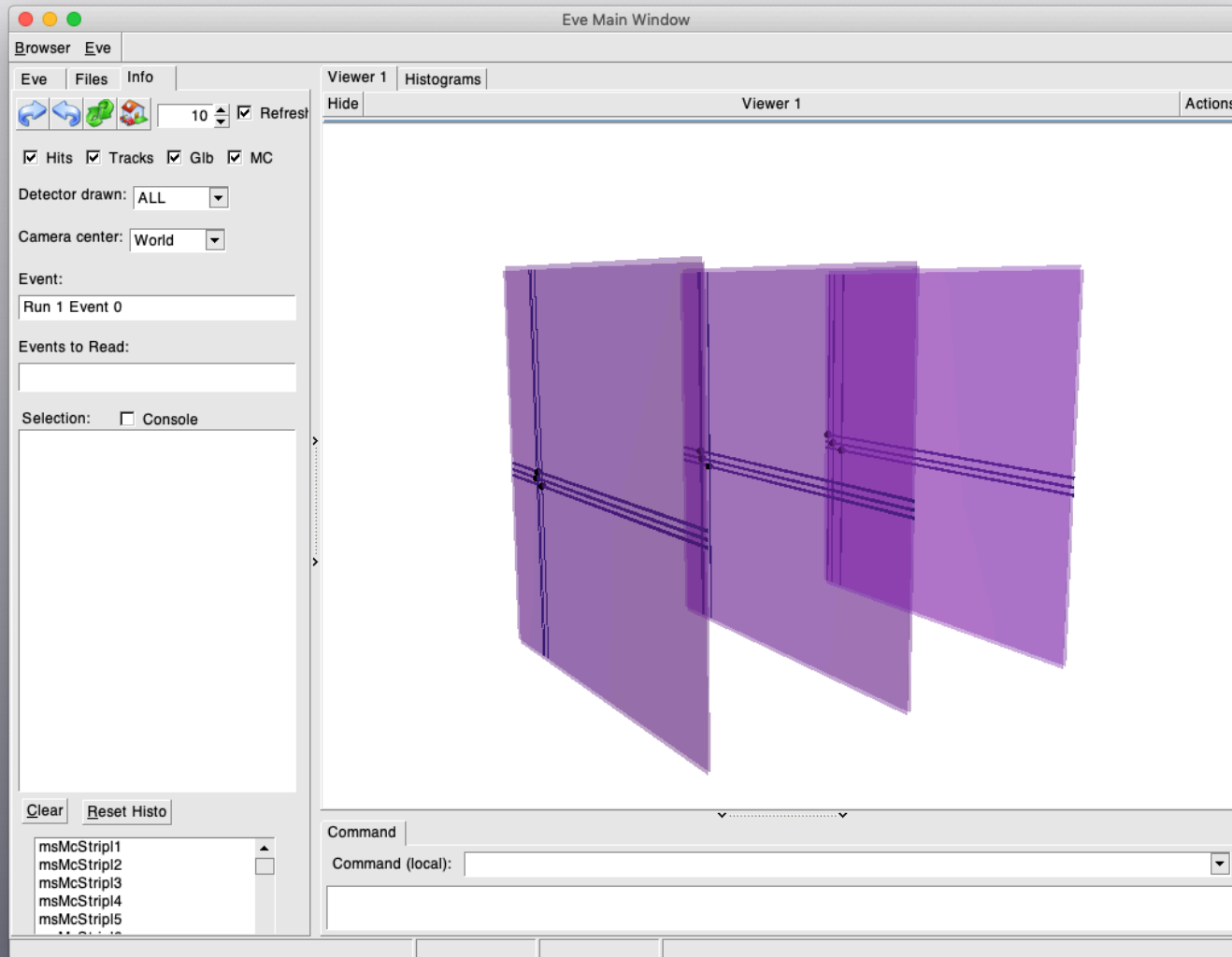
Inner Tracker display



- IT support not drawn here

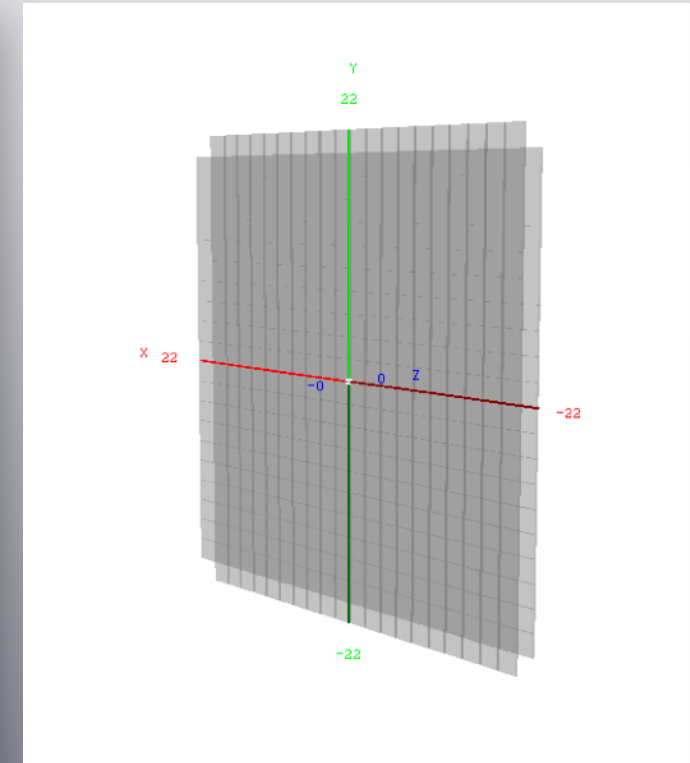
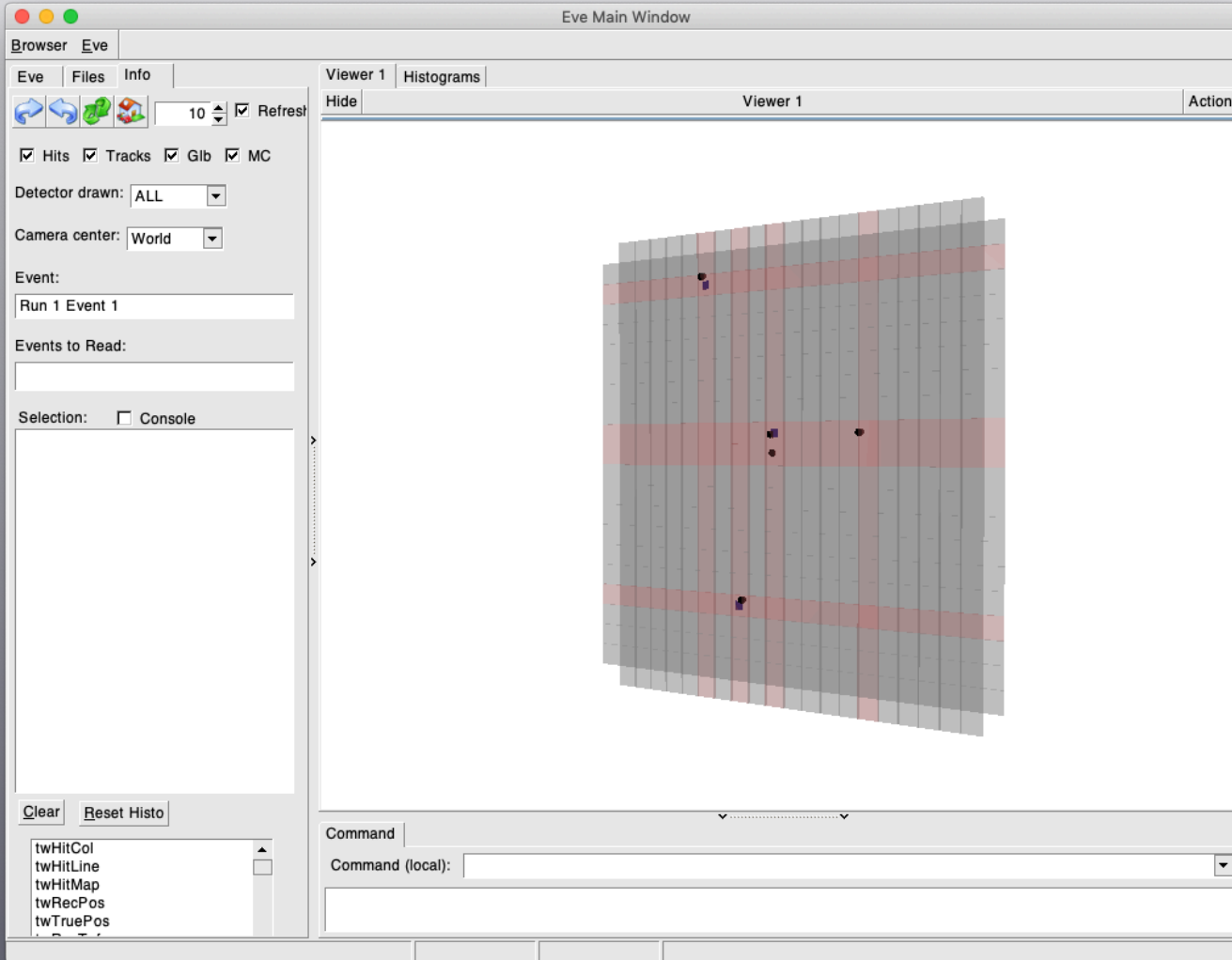
Detector Geometry (xi)

Multi strip detector display



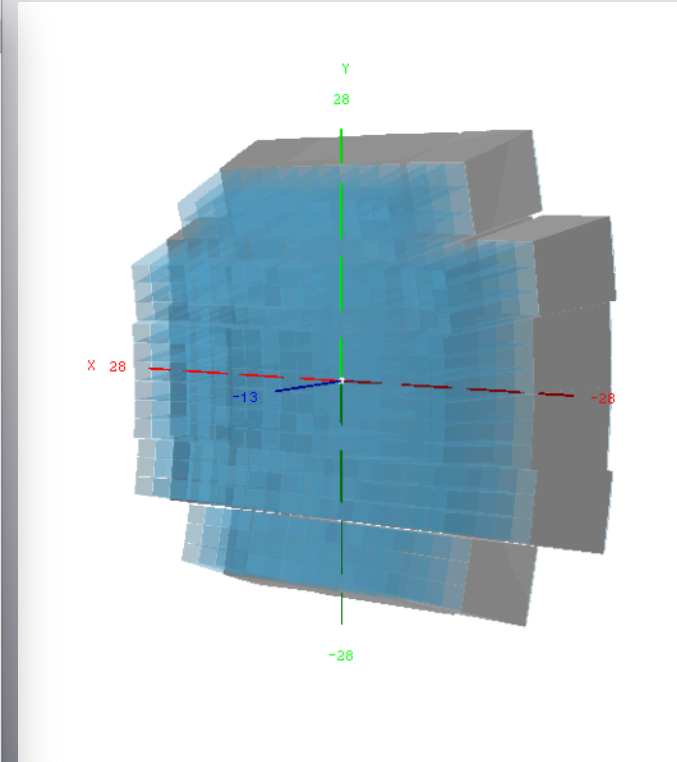
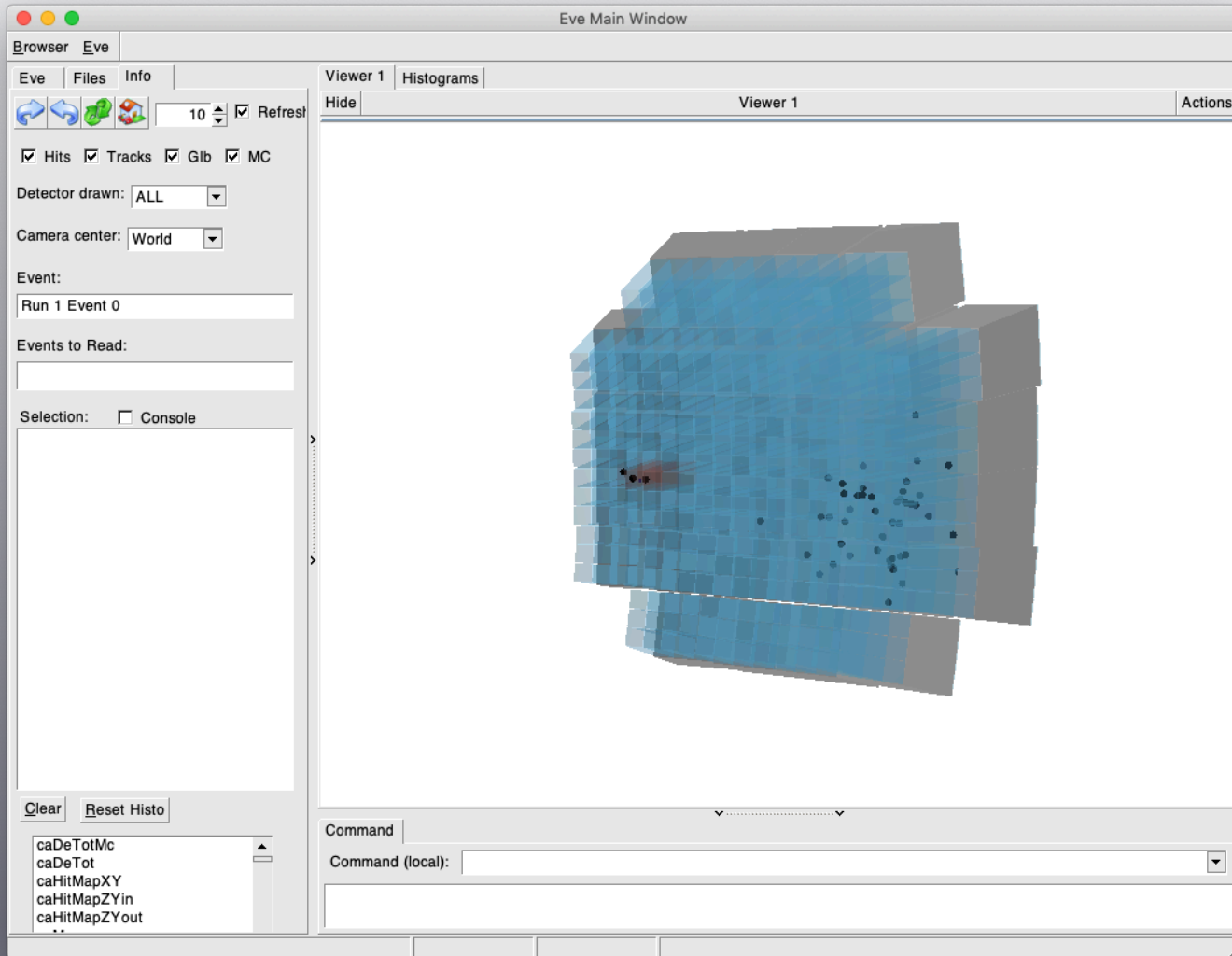
Detector Geometry (xiii)

Time of flight wall display



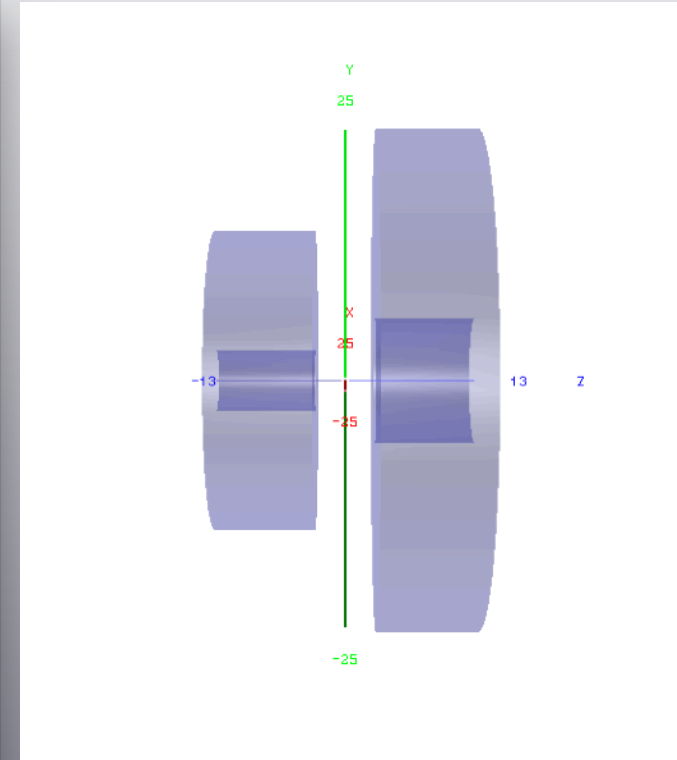
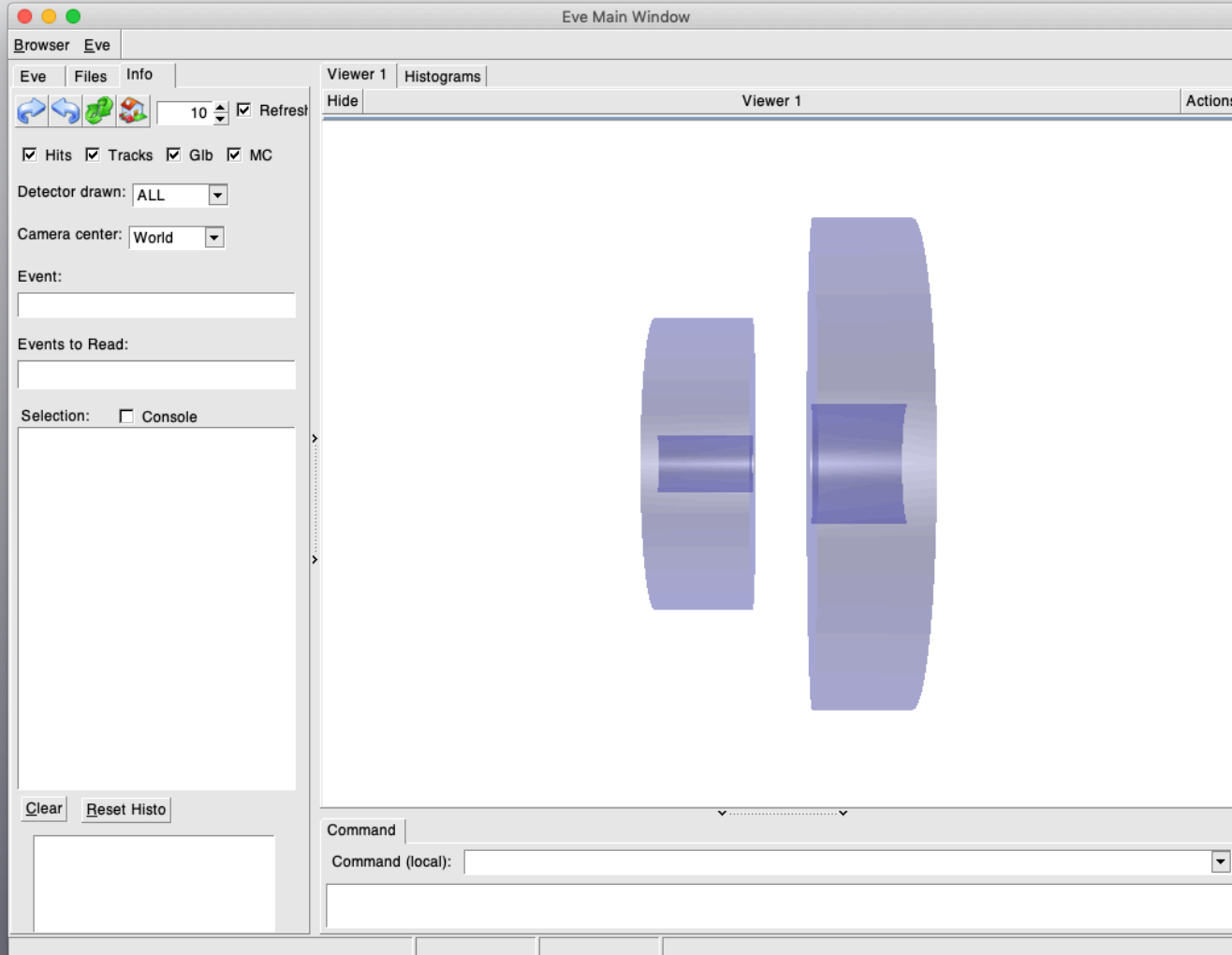
Detector Geometry (xv)

Calorimeter display



Detector Geometry (xvii)

• Dipole magnet display



FOOT

Global FOOT Geometry (i)

→ Global transformation: FOOT.geo (i)

```
// X,Y,Z and angles
StartBaseName: "ST"
StartPosX: 0. StartPosY: 0. StartPosZ: -29.
StartAngX: 0. StartAngY: 0. StartAngZ: 0.

TargetBaseName: "TG"
TargetPosX: 0. TargetPosY: 0. TargetPosZ: 0.
TargetAngX: 0. TargetAngY: 0. TargetAngZ: 0.

BmBaseName: "BM"
BmPosX: 0. BmPosY: 0. BmPosZ: -14.
BmAngX: 0. BmAngY: 0. BmAngZ: 0.

VertexBaseName: "VT"
VertexPosX: 0. VertexPosY: 0. VertexPosZ: 1.5
VertexAngX: 0. VertexAngY: 0. VertexAngZ: 0.

MagnetsBaseName: "DI"
MagnetsPosX: 0. MagnetsPosY: 0. MagnetsPosZ: 14.
MagnetsAngX: 0. MagnetsAngY: 0. MagnetsAngZ: 0.

InnerTrackerBaseName: "IT"
InnerTrackerPosX: 0. InnerTrackerPosY: 0. InnerTrackerPosZ: 14.
InnerTrackerAngX: 0. InnerTrackerAngY: 0. InnerTrackerAngZ: 0.

MultiStripBaseName: "MSD"
MultiStripPosX: 0. MultiStripPosY: 0. MultiStripPosZ: 29.
MultiStripAngX: 0. MultiStripAngY: 0. MultiStripAngZ: 0.
```

Global FOOT Geometry (ii)

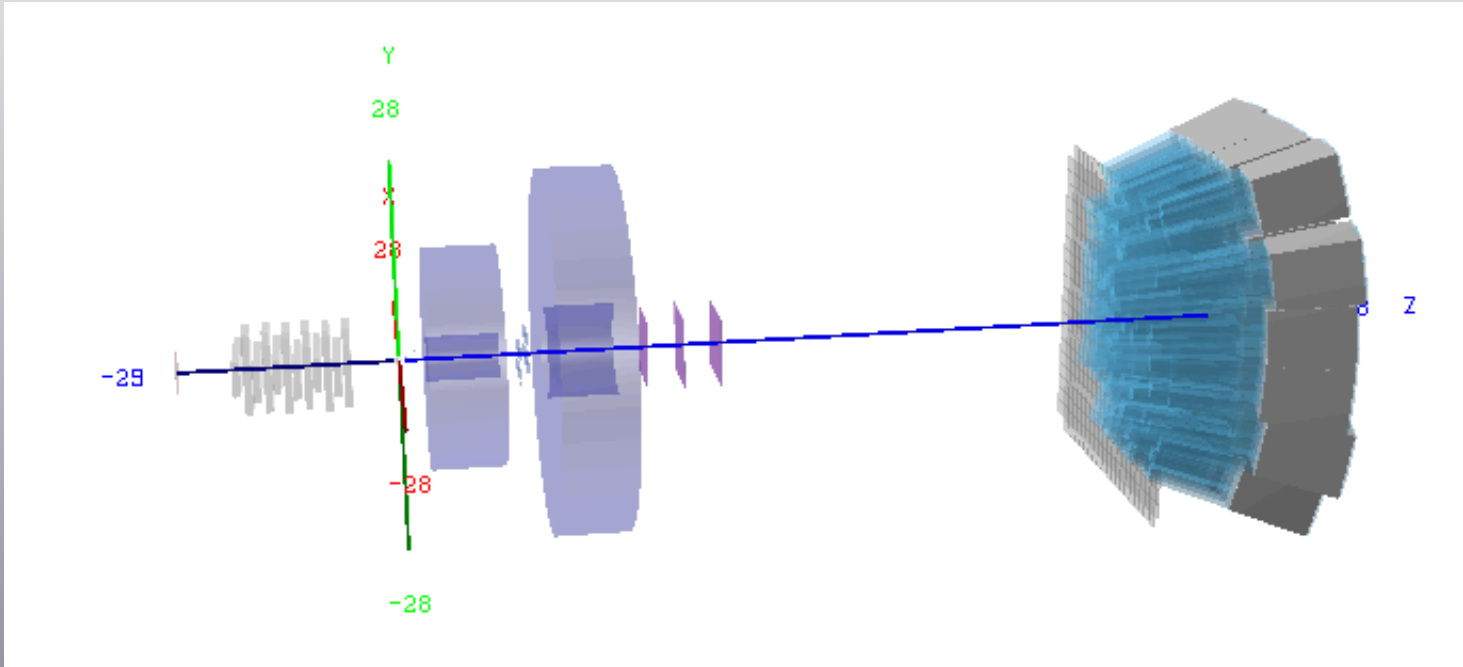
• Global transformation: FOOT.geo (ii)

```
TofWallBaseName: "TW"  
TofWallPosX: 0. TofWallPosY: 0. TofWallPosZ: 99.7  
TofWallAngX: 0. TofWallAngY: 0. TofWallAngZ: 0.  
  
CaloBaseName: "CA"  
CaloPosX: 0. CaloPosY: 0. CaloPosZ: 110.8  
CaloAngX: 0. CaloAngY: 0. CaloAngZ: 0.
```

- Global transformation from FOOT.geo file read by TAGgeoTrafo class
- Transformations :
 - TVector3 TAGgeoTrafo::FromGlobalTo*Local(TVector3 vec), from global to detector
 - TVector3 TAGgeoTrafo::From*LocalToGlobal(TVector3 vec), from detector to global(* for ST-BM-VT-IT-DI-MSD-TW-CA
- ➔ All geometry files are specific to a campaign name
- ➔ Overlapping volumes NOT checked !!

Global FOOT Geometry (iii)

• FOOT framework



- Origin at the center of the target
- ➔ All detectors built in detector framework and then placed in the FOOT framework

End